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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/046,007	03/23/98	HAN et al.	HT98-002

EXAMINER	
Shamim Ahmed	
ART UNIT	PAPER NUMBER
1746	8

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) Shamim Ahmed (3) _____
(2) Alek P. Szecsy (4) _____

Date of Interview: _____

Type: ☒ Telephonic ☐ Televideo Conference ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No If yes, brief description: _____

Agreement ☐ was reached. ☒ was not reached.

Claim(s) discussed: 21-28

Identification of prior art discussed: None

Description of the general nature of what was agreed to if an agreement was reached, or any other comments:

Discussed Fig NO. 1, in view of the Specification and will fax the
allowed claims from HT 96-010C (S/N 09/046,008) and also
provide the basic differences between the presently claimed
invention and S/N 09/046,008 (HT 96-010C).

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

Manual of Patent Examining Procedure; Section 713.04 Substance of Interview must Be Made of Record

Except as otherwise provided, a complete written statement as to the substance of any face-to-face or telephone interview with regard to an application must be made of record in the application, whether or not an agreement with the examiner was reached at the interview.

§1.133 Interviews

(b) In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111 and 1.135. (35 U.S.C. 132)

§ 1.2. Business to be transacted in writing. All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and, to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete a two-sheet carbon interleaf Interview Summary Form for each interview held after January 1, 1978 where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks in neat handwritten form using a ball point pen. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, pointing out typographical errors or unreadable script in Office actions or the like, or resulting in an examiner's amendment that fully sets forth the agreement are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the right hand portion of the file, and listed on the "Contents" list on the file wrapper. In a personal interview, the duplicate copy of the Form is removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication.

The Form provides for recordation of the following information:

- Application Number of the application
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (personal or telephonic)
- Name of participant(s) (applicant, attorney or agent, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the claims discussed
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
- The signature of the examiner who conducted the interview
- Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner,
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will give the applicant one month from the date of the notifying letter to complete the reply and thereby avoid abandonment of the application (37 CFR 1.135(c)).

Examiner to Check for Accuracy

Applicant's summary of what took place at the interview should be carefully checked to determine the accuracy of any argument or statement attributed to the examiner during the interview. If there is an inaccuracy and it bears directly on the question of patentability, it should be pointed out in the next Office letter. If the claims are allowable for other reasons of record, the examiner should send a letter setting forth his or her version of the statement attributed to him. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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FACSIMILE TRANSMISSION COVER SHEET

TO: Examiner Shamim Ahmed
USPTO
703-305-1929 voice
703-305-7719 facsimile

DATE: 1 December 1999

PAGES: Ten pages follow this facsimile transmission cover sheet.

RE: Serial Number 09/046,007; Attorney Docket Number HT 98-002

Hi
Saw
Diet
MK
4

MESSAGE:

Dear Examiner Ahmed:

In accord with our conversation this morning, appended are: (1) marked up copies of Fig. 1 and Fig. 2 from the subject patent application illustrating pertinent layers which correspond with claim 21; and (2) copies of allowed claims from HT 96-010C (S/N 09/046,008).

With respect to differences between the presently claimed invention and HT 96-010C, please note that the present invention newly discloses and claims an additional antiferromagnetic or hard bias transverse magnetic bias layer 28a or 28a' contacting a surface of a soft adjacent layer (SAL) opposite a magnetoresistive (MR) layer. Among other limitations within the presently claimed invention, this feature appears to be absent from the cited prior art.

I hope that this information is useful in you reconsideration of this application. Please feel free to contact me should you need any additional assistance.

CONFIDENTIALITY NOTICE

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SN 09/046, 007

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HT 96-002
A/2K

NOTE: Invention differs from HT 96-010 & HT 96-010C, by addition of the TRANSVERSE BIAS layer 28a or 28a' adjoining side of SAL 26a or 26a' opposite the MR layer 16a or 16a' at least in part

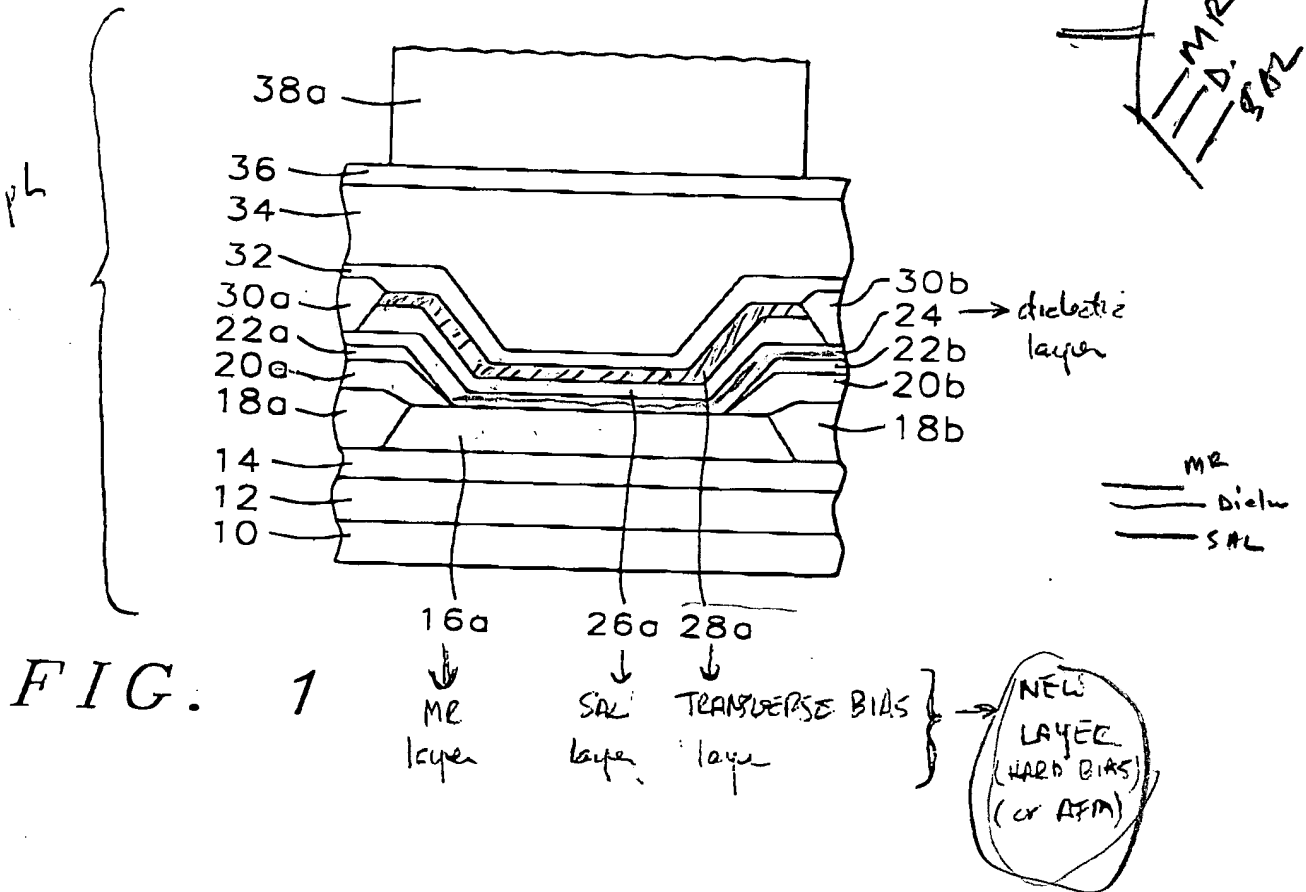
EMBODIMENT
#1see paragraph
bridging pgs
12-13

FIG. 1

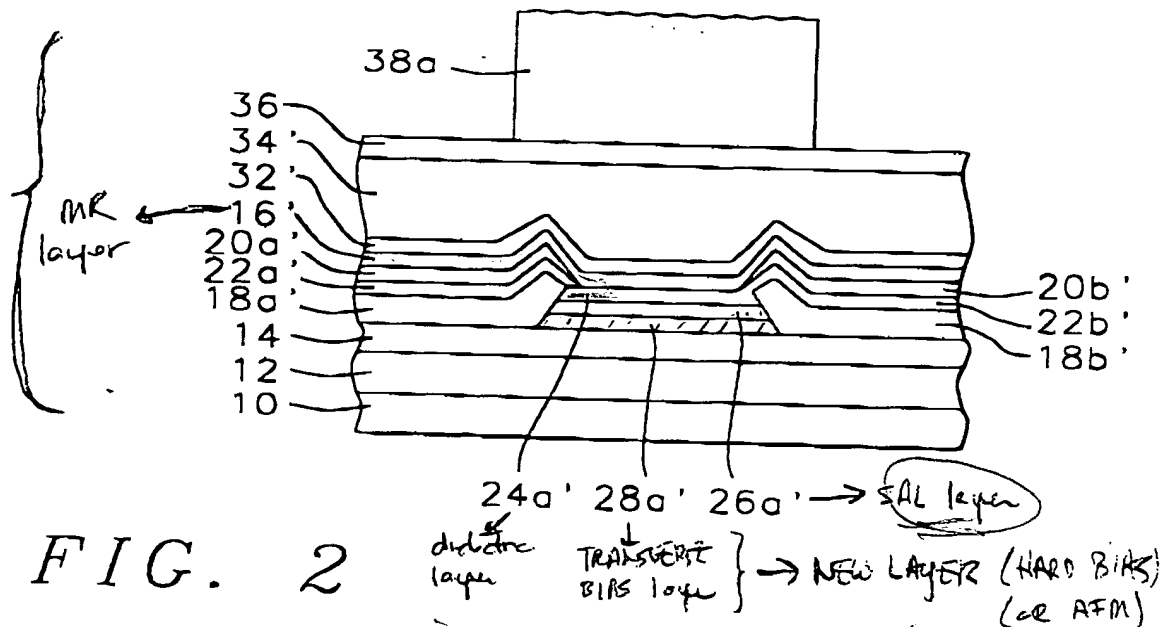
EMBODIMENT
#2see first
full
paragraph
or pg 18

FIG. 2

HT 96-010C

Serial Number 09/046,008

In the Claims

Please amend claims 1, 3, 8 and 10-12 as follows:

1. (amended) A soft adjacent layer (SAL) magnetoresistive (MR) sensor element comprising:
 - a substrate;
 - a dielectric layer formed over the substrate, the dielectric layer having a first surface of the dielectric layer and a second surface of the dielectric layer opposite the first surface of the dielectric layer;
 - a magnetoresistive (MR) layer formed over the substrate, the magnetoresistive (MR) layer contacting the first surface of the dielectric layer; [and]
 - a soft adjacent layer (SAL) formed over the substrate, the soft adjacent layer (SAL) contacting the second surface of the dielectric layer, where each of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer is planar; and
 - a second dielectric layer formed over the substrate, where the second dielectric layer fully encapsulates and passivates a series of edges of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer.

3. (amended) The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein:

the magnetoresistive (MR) layer [is] and the soft adjacent layer (SAL) are each formed from a [magnetoresistive (MR)] soft magnetic material selected from the group of [magnetoresistive (MR) materials] soft magnetic materials consisting of permalloy alloys, [and]

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higher order alloys incorporating permalloy alloys and cobalt-zirconium-niobium amorphous alloys; and

the dielectric layer is formed from a dielectric material selected from the group of dielectric materials consisting of aluminum oxide, silicon oxide and nitrogenated carbon dielectric materials.

8. (amended) A method for fabricating a magnetoresistive (MR) sensor element comprising:

providing a substrate;

forming over the substrate a dielectric layer, the dielectric layer having a first surface of the dielectric layer and a second surface of the dielectric layer opposite the first surface of the dielectric layer;

forming over the substrate a magnetoresistive (MR) layer contacting the first surface of the dielectric layer; [and]

forming over the substrate a soft adjacent layer (SAL) contacting the second surface of the dielectric layer, where each of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer is planar; and

forming then over the substrate a second dielectric layer fully encapsulating and passivating a series of exposed edges of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer, where at least one of the magnetoresistive (MR) layer and the soft adjacent layer (SAL) is formed of a cobalt-zirconium-niobium amorphous alloy soft magnetic material.

10. (amended) The method of claim 8 wherein:

the magnetoresistive (MR) layer is formed from a magnetoresistive (MR) material selected

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from the group of magnetoresistive (MR) materials consisting of permalloy alloys and higher order alloys incorporating permalloy alloys; and]

the dielectric layer is formed from a dielectric material selected from the group of dielectric materials consisting of aluminum oxide, silicon oxide and nitrogenated carbon dielectric materials.

11. (amended) The method of claim 8 wherein the other of the magnetoresistive (MR) layer and the soft adjacent layer (SAL) is formed from a soft magnetic material selected from the group of soft magnetic materials consisting of permalloy alloys[,] and higher order alloys incorporating permalloy alloys[, nickel-iron-chromium alloys and cobalt-zirconium-niobium amorphous alloys].

12. (amended) The method of claim 8 wherein the magnetoresistive (MR) layer and the soft adjacent layer (SAL) are formed of the same cobalt-zirconium-niobium amorphous alloy soft magnetic material.

Please cancel claim 4.

Please add claim 19, claim 20 and claim 21 as follows:

19. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein the second dielectric layer is a single layer second dielectric layer.

20. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein the second dielectric layer does not completely cover any one of the magnetoresistive (MR) layer, the

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soft adjacent layer (SAL) and the dielectric layer.

21. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 6 further comprising a patterned dielectric passivation layer formed upon the magnetoresistive (MR) layer, where the patterned dielectric passivation layer defines a pair of vias which expose the pair of opposite ends of the magnetoresistive (MR) layer, and where the pair of patterned layers magnetically coupled with the pair of opposite ends of the magnetoresistive (MR) layer is formed into the pair of vias.

REMARKS

Favorable reconsideration of this application in light of the above amendments and following remarks is respectfully requested.

Claims 1-3 and 5-21 are pending in this application. Claims 1, 3, 8 and 10-12 are amended herein. Claim 4 is canceled herein. Claims 19-21 are newly added herein. No claims have been allowed.

Claim 3 is amended and claim 4 is canceled to provide a more accurate correspondence with applicant's specification within the first full paragraph on page 12.

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1. A soft adjacent layer (SAL) magnetoresistive (MR) sensor element comprising:
 - a substrate;
 - a dielectric layer formed over the substrate, the dielectric layer having a first surface of the dielectric layer and a second surface of the dielectric layer opposite the first surface of the dielectric layer;
 - a magnetoresistive (MR) layer formed over the substrate, the magnetoresistive (MR) layer contacting the first surface of the dielectric layer; and
 - a soft adjacent layer (SAL) formed over the substrate, the soft adjacent layer (SAL) contacting the second surface of the dielectric layer, where each of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer is planar.
2. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer are at least substantially co-extensive.
3. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein:
 - the magnetoresistive (MR) layer is formed from a magnetoresistive (MR) material selected from the group of magnetoresistive (MR) materials consisting of permalloy alloys and higher order alloys incorporating permalloy alloys; and
 - the dielectric layer is formed from a dielectric material selected from the group of dielectric materials consisting of aluminum oxide, silicon oxide and nitrogenated carbon dielectric materials.
4. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein the soft adjacent layer (SAL) is formed from a soft magnetic material selected from the group of soft

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magnetic materials consisting of permalloy alloys, higher order alloy incorporating permalloy alloys, nickel-iron-chromium alloys and cobalt-zirconium-niobium amorphous alloys.

5. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 wherein the magnetoresistive (MR) layer and the soft adjacent layer (SAL) are formed of the same material.

6. The soft adjacent layer (SAL) magnetoresistive (MR) sensor element of claim 1 further comprising a pair of patterned layers magnetically coupled with a pair of opposite ends of the magnetoresistive (MR) layer, the pair of patterned layers being selected from the group of patterned layers consisting of patterned antiferromagnetic longitudinal magnetic bias layers and patterned permanent magnet bias layers, where the pair of patterned antiferromagnetic longitudinal magnetic bias layers is formed of a high coercivity hard magnetic material selected from the group of hard magnetic materials consisting of iron-manganese alloy, nickel-manganese alloy, cobalt-platinum-chromium alloy and rare earth alloy hard magnetic materials.

7. A soft adjacent layer (SAL) magnetoresistive (MR) read-write head having fabricated therein a soft adjacent layer (SAL) magnetoresistive (MR) sensor element in accord with claim 1.

8. A method for fabricating a magnetoresistive (MR) sensor element comprising:
providing a substrate;
forming over the substrate a dielectric layer, the dielectric layer having a first surface of the dielectric layer and a second surface of the dielectric layer opposite the first surface of the dielectric layer;
forming over the substrate a magnetoresistive (MR) layer contacting the first surface of the dielectric layer; and

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forming over the substrate a soft adjacent layer (SAL) contacting the second surface of the dielectric layer, where each of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer is planar.

9. The method of claim 8 wherein the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer are at least substantially co-extensive.

10. The method of claim 8 wherein:

the magnetoresistive (MR) layer is formed from a magnetoresistive (MR) material selected from the group of magnetoresistive (MR) materials consisting of permalloy alloys and higher order alloys incorporating permalloy alloys; and

the dielectric layer is formed from a dielectric material selected from the group of dielectric materials consisting of aluminum oxide, silicon oxide and nitrogenated carbon dielectric materials.

11. The method of claim 8 wherein the soft adjacent layer (SAL) is formed from a soft magnetic material selected from the group of soft magnetic materials consisting of permalloy alloys, higher order alloys incorporating permalloy alloys, nickel-iron-chromium alloys and cobalt-zirconium-niobium amorphous alloys.

12. The method of claim 8 wherein the magnetoresistive (MR) layer and the soft adjacent layer (SAL) are formed of the same material.

13. The method of claim 8 wherein:

the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer are

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formed from a corresponding blanket magnetoresistive (MR) layer, a corresponding blanket soft adjacent layer (SAL) and a corresponding blanket dielectric layer through use of an etch method employing a lift off stencil as an etch mask; and

the lift off stencil is subsequently employed in forming a second dielectric layer passivating the edges of the magnetoresistive (MR) layer, the soft adjacent layer (SAL) and the dielectric layer.

14. The method of claim 13 wherein the etch method is selected from the group of etch methods consisting of ion beam etch (IBE) methods, reactive ion beam etch (RIBE) methods, sputtering etch methods and reactive sputtering etch methods.

15. The method of claim 8 further comprising forming a pair of patterned layers magnetically coupled with a pair of opposite ends of the magnetoresistive (MR) layer, the pair of patterned layers being selected from the group of patterned layers consisting of patterned antiferromagnetic longitudinal magnetic bias layers and patterned permanent magnet bias layers, where the pair of patterned antiferromagnetic longitudinal magnetic bias layers is formed of a hard magnetic material selected from the group of high coercivity hard magnetic materials consisting of iron-manganese alloy, nickel-manganese alloy, cobalt-platinum-chromium alloy and rare earth alloy hard magnetic materials.

16. The method of claim 15 wherein the pair of patterned layers is formed employing a lift off stencil method.

17. The method of claim 15 further comprising forming a patterned dielectric passivation layer upon the patterned magnetoresistive (MR) layer prior to forming the pair of patterned layers

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magnetically coupled with the pair of opposite ends of the magnetoresistive (MR) layer, the patterned dielectric passivation layer defining a pair of vias which expose the pair of opposite ends of the patterned magnetoresistive (MR) layer, where the pair of patterned layers magnetically coupled with the pair of opposite ends of the patterned magnetoresistive (MR) layer is formed into the pair of vias while employing a blanket layer deposition and patterning method.

18. A soft adjacent layer (SAL) magnetoresistive (MR) read-write head having formed therein a soft adjacent layer (SAL) magnetoresistive (MR) sensor element fabricated in accord with claim 8.

*** RX REPORT ***

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